

30 April 2020

(Revised after initial release to clarify pumped hydro costs)

Dear Stakeholders,

The following is an update on how feedback received through the Integrated System Plan (ISP) consultation process and AEMO's Inputs, Assumptions and Scenarios Report (IASR) consultation is being incorporated into the Final 2020 ISP.

Draft 2020 ISP consultation

As discussed in our [stakeholder update](#) in March, AEMO recently ran a series of workshops and a formal consultation on the Draft 2020 ISP. Feedback received included that transmission costs were likely to rise in coming years, costs for batteries were too high, and costs for pumped hydro development were too low.

2020 Inputs, Assumptions and Scenarios Report (IASR) consultation

Prior to this, in December 2019 AEMO commenced stakeholder [consultation on the IASR](#), which also provided an opportunity to give feedback on the CSIRO 2019-20 GenCost preliminary results. Each year, AEMO reviews and updates the IASR which is used by the Forecasting group to assess the forecast demand, supply, and adequacy of Australia's electricity and gas markets¹. These inputs are used to develop several AEMO publications, including the Electricity Statement of Opportunities (ESOO) and the ISP.

The feedback on costs from the 2020 IASR consultation aligned with that received from the Draft 2020 ISP consultation.

Outcome for the Final 2020 ISP

AEMO has made some changes to the cost inputs for the Final 2020 ISP, to assess whether and how the risks of increased costs in some key areas might impact the ISP development plan.

The updates incorporated in the Final 2020 ISP include:

- **An increase in transmission capital costs:** To this point, each major transmission project identified in the ISP that has gone through the RIT-T process has demonstrated an approximate 30% increase in cost from initial estimates, due to a range of factors. As a consequence, AEMO in collaboration with the responsible Transmission Network Service Providers (TNSP) is increasing its capital cost estimates by approximately 30% and adjusted for the specific project circumstances on all identified ISP transmission projects, in order to reflect the feedback from the consultations. As more information on projects becomes available, AEMO may run further sensitivities with adjusted transmission cost assumptions,

¹ Including the National Electricity Market, Wholesale Electricity Market, Northern Territory's regulated power systems, Eastern and South-Eastern Australian gas markets and the Western Australia domestic gas market.

to ensure the most up to date information is used for the 2020 ISP, where practical and material.

- **An increase in future pumped hydro capital costs:** Feedback received during the consultation was that pumped hydro costs were under-estimated in the Draft ISP, and a high degree of uncertainty exists for desktop cost estimates of this type. In addition, it was recognised that there are higher risks and barriers to investment in pumped hydro compared to other forms of storage, as evidenced by the higher number of utility scale battery projects currently being planned across the NEM. Anecdotal evidence provided in submissions, in discussions with some proponents and through engagement with reputable consultants with experience in pumped hydro developments, suggest an increase in costs of approximately 50% is appropriate. This figure has been adopted for the Final 2020 ISP modelling, in order to test the robustness of the estimates. This magnitude of increase is aligned with experience in other major infrastructure projects, where it was noted that major infrastructure projects by their nature can experience capital cost increases over initial estimates during the implementation. AEMO has also commissioned additional work by international experts to further refine this estimate. For clarification, the capital cost increases foreshadowed for pumped hydro projects only apply to future uncommitted pumped hydro projects, and do not apply to the Snowy 2.0 project. AEMO considers Snowy 2.0 as a committed project and is not aware of any changes to the capital costs since the publication of its feasibility study.
- **A decrease in large-scale battery costs (depending on storage depth) and an extension of utility battery life:** Feedback from both the ISP and IASR consultations indicated that the projections of battery costs applied by AEMO in the modelling could be high by a factor of 30-40%. It was also noted that many companies now plan to extend battery life by replacing battery modules mid-life while retaining the balance of plant equipment.
- **An increase in gas-powered generation (GPG) capital costs:** The IASR consultation received feedback that smaller aero-derivative type gas-turbines and reciprocating gas engines, which provide greater flexibility compared to the larger industrial open-cycle turbines, are more likely developments in the future NEM. This will drive an increase of 30-60% in overall GPG costs per kW (but may be a more efficient solution).
- **Adjustments to the build limits of renewable energy in some renewable energy zones (REZs):** Based on feedback specific to certain REZs, AEMO has adjusted the information applied in modelling pertaining to the ability to develop new generation in those areas.
- **Generation project development updates:** Revised data was taken from AEMO's February 2020 [Generation Information release](#) and discussions with Transmission Network Service Providers, reflecting up-to-date development status for new generation projects and expected closures of existing generators.

Other feedback that will be incorporated into the Final 2020 ISP includes:

- Addition of a section on climate resilience, based on the overwhelming support throughout the Draft 2020 ISP workshops and in written feedback to the consultation.
- Expansion of the discussion on the potential impact of hydrogen on the future energy systems of eastern and south-eastern Australia.

- Deferral of analysis of the potential future impacts on Marginal Loss Factors (MLFs) to a separate report, to be published after the Final 2020 ISP to allow for a more comprehensive assessment.

The ISP Consultation Summary Report will be published along with the Final 2020 ISP.

COVID-19

We are all very much aware of the impact that COVID-19 is having on individuals and businesses across the world. AEMO has observed a small reduction in electricity demand due to reduction in industrial and commercial loads, partially offset by increases in domestic energy use due to people working from home. AEMO is closely watching demand trends both here and internationally. At this stage it appears that the impact of COVID-19 on the electricity sector is less than in many other countries. AEMO is considering the possible implications for the ISP analysis due to COVID-19. More information will be provided once a set of COVID-19 scenarios have been more fully developed.

Feedback was received that projections of the rate of uptake of rooftop PV were too low. This was considered further, but in the light of potential economic and financial impacts of the COVID-19 restrictions, it was decided that there was not sufficient data to justify a change to this input.

With respect to the potential impact of COVID-19 and arrangements for staff working from home on the date for release of the Final 2020 ISP, AEMO is continually reviewing the evolving situation, and will advise accordingly.

We hope that you all remain healthy in these challenging times!

Regards,

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